

REMARKS

We have carefully considered the Office Action dated February 25, 2004, in which claims 58, 61 and 67 are allowed, claim 64 is objected to and the remaining claims are rejected over Kariakin in combination with Raterman et al. or Keating, and various other references. In response to objections raised by the Examiner in paragraph 5 of the Office Action, we have amended claim 13 and claim 64. Further, we have amended claim 28 to more particularly point out the invention.

We disagree that the cited combinations of references make obvious independent claims 1, 14, 28 and 42 and the claims that depend therefrom.

We discuss the current invention and the cited references below. First, we discuss independent claims 1, 14 and 42 and simultaneous illumination, next we discuss independent claim 28 and filtering techniques.

Independent Claims 1, 14 and 42

As the Examiner states, the Kariakin reference does not teach or suggest simultaneously illuminating a workpiece from a plurality of directions, as is set forth in independent claims 1, 14 and 42. As discussed in our previous response, simultaneous illumination has several distinct and important advantages over the illumination technique used in the Kariakin system.

For example, using simultaneous illumination allows the current system to capture only the more robust features of the surface topography of the workpiece, that is, deep craters or high mountains. In contrast, the single or sequential illumination used in the Kariakin system captures, in addition to the robust features, the features that are more susceptible to damage or wear such as lower mountains, shallower craters and so forth, which tend to adversely affect workpiece authentication operations that are based, in whole or in part, on surface topography. Further, simultaneous illumination provides better overall reliability in terms of invariance to orientation, that is, the ability to

authenticate a workpiece even if the orientation of the workpiece differs between the enrollment or indicium-creating operation and the authentication operation. As discussed, the orientation of the workpiece is relative to the light sources and the orientation to a single light source or respective sequentially operated light sources must be essentially the same for the enrollment and authentication operations. In contrast, using the current system, with multiple simultaneously operating sources, the orientation can differ with respect to a given source and still be appropriate relative to the combination of light sources.

United States Patent 5,295,196 to Raterman et al., is cited to show simultaneous illumination and the combination of Kariakin and Raterman is cited as making obvious independent claims 1, 14 and 42 and the claims that depend therefrom. The Raterman patent describes a system in which the reflection of light from printed patterns or indicia **on a currency surface** is used to determine the denomination of the currency during, for example, sorting operations. The Raterman system utilizes a mask to produce a thin illumination strip along the narrow dimension of the bill (Col. 27, lines 57 et seq). The system then looks at “variations in the dark and light content of the printed pattern or indicia on the bill surface” as evidenced by the reflected signals (Col. 2, lines 52-55), and compares the variations with “characteristic patterns” for the different currency denominations to sort and count the respective bills under study. (Col. 6, lines 18-44). The Raterman system is thus an **optical pattern reading system** for sorting and counting documents, and not a document authentication system. Accordingly, the Raterman system and the Kariakin system operate in entirely different manners and have entirely different objectives. Indeed, the Raterman system does not look at surface topography information, which is unique to a given workpiece, when the system attempts to match a printed pattern or indicia on the workpiece surface with one of the characteristic patterns that are produced by reading sample bills.

For at least the foregoing reasons, there is no suggestion to combine the teachings of Raterman with the teachings of Kariakin. Further, even if the teachings can be combined, the result is to add an optical reader to the Kariakin system. Thus, the combination would provide to the Kariakin system the ability to optically read a pattern

or indicia printed on the surface of a workpiece and match that pattern to one of a plurality of characteristic patterns, i.e., the ability to determine the denomination of a bill that the system is attempting to authenticate. Accordingly, such a combination does not teach or suggest the current system because, *inter alia*, the combination does not teach or suggest an indicium, a system, or a memory that utilizes one or more images of surface topographical appearance of at least one portion of a workpiece that are the result of illuminating the at least one portion with electromagnetic radiation simultaneously from different illumination positions, as is set forth in independent claims 1, 14 and 41 and the claims that depend therefrom.

Independent Claim 28

The Examiner cites United States Patent 6,072,538 to Keating in combination with Kariakin as making obvious independent claim 28 and the claims that depend therefrom. The Examiner points to page 20, lines 27-31 of Kariakin to support an “enhancement” of an image. The cited language supports combining multiple images of a selected portion of the workpiece, and the Kariakin system combines the multiple images by subtracting them. As the Kariakin references states: “using such a combined image reduces the possibility of fraudulent reproduction of the image while distinguishing between topography and surface markings.” There is no mention of filtering and, in particular, the type of filtering set forth in pending claim 28.

The cited language in the Keating reference describes a technique for enhancing a video image by first generating a “detail signal” containing frequency components of interest using band pass or high pass filters, and then **combining** the detail signal with the original signal to produce an enhanced original image (Col. 1, lines 17 et seq., Fig. 1). The enhanced original image thus includes all of the information in the original image plus the detail signal information. The Keating system then uses the enhanced original image in further operations, such as, for example, providing a video display. There is no teaching or suggestion in Keating to produce for use in further processing apart from the original image a filtered image that includes enhanced desired information and attenuated undesirable information, as done in the current inventive system.

Further, there is no teaching or suggestion in either Kariakin or Keating to combine the teachings of the Kariakin authentication system with the teachings of the Keating video image enhancement system. Even if the teachings could be combined, Keating adds to Kariakin the enhancement of the original image by including therein a detail signal, and using for further processing the resulting enhanced image, which includes all of the undesired image information as well as the enhanced image information. The combination thus does not teach or suggest the current invention because, *inter alia*, the combination does not teach or suggest a method for filtering one or more images to produce one or more filtered images, in which selected higher spatial frequencies of one or more images are emphasized and lower spacial frequencies are attenuated, and using the one or more filtered images to generate a string for workpiece authentication, as set forth in independent claim 28, as amended, and the claims that depend therefrom.

The claims, as amended, should now be in form for allowance. We respectfully request that the Examiner reconsider his rejections and issue a Notice of Allowance for all pending claims.

Please charge any additional fee occasioned by this paper to our Deposit Account No. 03-1237.

Respectfully submitted,



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